

IN THE CLAIMS:

1 Please cancel claims 2 and 19, without prejudice.

1 1. (Currently Amended): A fuel for use in a fuel cell, comprising:

2 (A) a carbonaceous fuel substance wherein said carbonaceous fuel substance is
3 substantially comprised of neat methanol; and

4 (B) a thickening substance that imparts viscosity to the fuel substance, thereby
5 forming a gel fuel.

1 2. Cancelled.

1 3. (Original): The fuel as defined in claim 1, wherein said neat methanol comprises be-
2 tween about 90 to 100 per cent by weight of the total composition of the fuel substance.

1 4. (Currently Amended): The fuel as defined in claim 1, wherein said thickening sub-
2 stance is substantially comprised of ~~Carbopol® EZ-3a~~ a hydrophobically modified cross-
3 linked polyacrylate polymer rheology modifier.

1 5. (Original): The fuel as defined in claim 1, wherein said thickening substance com-
2 prises about 2 per cent by weight of the total composition of the fuel substance.

1 6. (Previously Presented): The fuel as defined in claim 27, wherein said alkaline pH-
2 modifying substance is in an amount sufficient to adjust the pH to a value of about 4.0.

1 7. (Previously Presented): The fuel as defined in claim 27, wherein said alkaline pH-
2 modifying substance is substantially comprised of sodium hydroxide.

1 8. (Previously Presented): The fuel as defined in claim 27, wherein said alkaline pH-
2 modifying substance comprises about 0.04 per cent by weight of the total composition of
3 the fuel substance.

1 9. (Original): The fuel as defined in claim 1 in which the gel fuel has a viscosity of be-
2 tween about 1000 to 48,000 mPa s.

1 10. (Original): The fuel as defined in claim 1, further comprising safety enhancing addi-
2 tives.

1 11. (Original): The fuel as defined in claim 10 wherein said safety-enhancing additives
2 are selected from the group consisting of colorants, bitters, flame retardants.

1 12. (Original): The fuel as defined in claim 1, further comprising polymeric additives.

1 13. (Currently Amended): A fuel cartridge for use with a fuel cell, the cartridge com-
2 prising:

- 3 (A) a replaceable compartment for holding a fuel suspended in a gel; and
4 (B) a fuel vapor permeable layer "FVPL" forming one aspect of said compart-
5 ment, said FVPL being permeable to a fuel substance that is released out of
6 said gel, and said aspect of said compartment being coupled with said fuel
7 cell in such a manner that the fuel travels through said FVPL into said fuel
8 cell.

1 14. (Currently Amended): A fuel cartridge for use with a fuel cell, the cartridge com-
2 prising:

- 3 (A) a compartment for holding a fuel suspended in a gel; and
4 (B) a fuel vapor permeable layer "FVPL" forming one aspect of said compart-
5 ment, said FVPL being permeable to a fuel substance that is released out of
6 said gel, and said aspect of said compartment being coupled with said fuel cell
7 in such a manner that the fuel travels through said FVPL into said fuel
8 cell. ~~The fuel cartridge as defined in claim 13~~ wherein said FVPL is substan-
9 tially comprised of a highly selective monolithic material having selectivity
10 between fuel substance and water, such that fuel substance can travel through
11 said monolithic material to said fuel cell and water is substantially resisted
12 from travelling from said fuel cell into said fuel cartridge.

1 15. (Original): The fuel cartridge as defined in claim 14 further comprising multiple
2 FVPLs, at least one of which is said highly selective material.

1 16. (Original): The fuel cartridge as defined in claim 13 wherein said FVPL is substan-
2 tially comprised of a porous material that allows fuel substance to travel into said fuel
3 cell and water to pass into said cartridge.

1 17. (Original): The fuel cartridge as defined in claim 16 further comprising surface area
2 increasing features having multiple components upon which gel can adhere to provide an
3 increased surface area of exposed gel.

1 18. (Original): The fuel cartridge as defined in claim 13 further comprising a fuel im-
2 permeable removable seal that retains the fuel substance within the cartridge prior to the
3 fuel cell being used.

1 19. Cancelled.

1 20. (Currently Amended): ~~The method of supplying fuel to a fuel cell as defined in claim 19~~
2 ~~including the further steps of~~ A method of supplying fuel to a fuel cell, the method compris-
3 ing the steps of:

4 (A) providing a fuel substance suspended within a gel such that when contacting air,
5 fuel is evaporated out of said gel;~~providing neat methanol;~~

6 (B) directing said evaporated fuel substance into a fuel cell using a fuel vapor perme-
7 able layer "FVPL" coupled to a fuel cell which FVPL allows fuel substance to
8 pass through it into said fuel cell;~~mixing a thickening substance into said neat~~
9 ~~methanol;~~

- 10 (C) ~~adding a pH balancing substance to said neat methanol mixture to form a gel fu-~~
11 ~~el~~providing as said fuel substance neat methanol;
- 12 (D) ~~placing said gel fuel in a cartridge that has at least one methanol permeable wall;~~
13 ~~and~~mixing a thickening substance into said neat methanol;
- 14 (E) ~~attaching said cartridge to a fuel cell with said methanol permeable wall contigu-~~
15 ~~ous to an anode aspect of said fuel cell to thereby supply fuel to said fuel cell~~ad-
16 ding a pH balancing substance to said neat methanol mixture to form a gel fuel;-
- 17 (F) placing said gel fuel in a cartridge that has at least one FVPL having a methanol
18 permeable wall; and
- 19 (G) attaching said cartridge to a fuel cell with said methanol permeable wall contigu-
20 ous to an anode aspect of said fuel cell to thereby direct said evaporated fuel sub-
21 stance into the fuel cell.

1 21. (Original): The method as defined in claim 20 including the further step of reconstitut-
2 ing the gel fuel by adding additional liquid fuel.

1 22. (Currently Amended): A direct oxidation fuel cell system, comprising:

2 (A) a direct oxidation fuel cell including:

- 3 (i) a membrane electrolyte intimately interfacing with a catalyst layer
4 along each of membrane's major surfaces, being a catalyzed mem-
5 brane electrolyte, having an anode aspect and a cathode aspect;
- 6 (ii) an effective water supply from cathode to anode within said fuel cell,
7 so that water management in said fuel cell is achieved without water
8 collection from the cathode and/or water transport from cathode to an-
9 ode external to the active volume of the fuel cell;

10 (B) a replaceable fuel supply cartridge including:

11 (i) a compartment for holding a fuel substance suspended in a gel; and

12 (ii) a fuel vapor permeable layer "FVPL" forming one aspect of said com-
13 partment, said FVPL being permeable to the fuel substance that is re-
14 leased out of said gel, and said aspect of said compartment being cou-
15 pled with said fuel cell in such a manner that the fuel travels through
16 said FVPL into said fuel cell; and

17 (C) an electrical coupling across said fuel cell for supplying power to an application
18 device.

1 23. (Original): A fueling device for a fuel cell system, comprising:

2 (A) an internal fuel compartment that contains a gel fuel coupled to at least one fuel
3 cell in the fuel cell system for delivering a fuel substance that evaporates out of
4 said gel fuel; and

5 (B) a replacement container coupled to said internal fuel compartment for refueling
6 the gel fuel in said compartment.

1 24. (Original): The fueling device as defined in claim 23 wherein said fuel cell system and
2 said internal fuel compartment are disposed within an application device.

1 25. (Original): The fueling device as defined in claim 23 wherein said replacement con-
2 tainer houses a gel fuel for replacing gel fuel in said internal fuel compartment.

1 26. (Original): The fueling device as defined in claim 23 wherein said replacement con-
2 tainer houses a liquid fuel for delivery to said internal fuel compartment to reconstitute the
3 gel fuel that supplies said fuel cell system.

1 27. (Previously Presented) The fuel as defined in claim 1, further comprising an alkaline
2 pH-modifying substance.